POSITION ESTIMATION USING A NETWORK OF GLOBAL-POSITIONING RECEIVERS

ABSTRACT OF THE DISCLOSURE

Disclosed are methods and apparatuses for determining the position of a roving receiver in a coordinate system using at least two base-station receivers, which are located at fixed and known positions within the coordinate system. The knowledge of the precise locations of the base-station receivers makes it possible to better account for one or all of carrier ambiguities, receiver time offsets, and atmospheric effects encountered by the rover receiver, and to thereby increase the accuracy of the estimated receiver position of the rover. Base lines are established between the rover and each base-station, and a base line is established between the base stations. Navigation equations, which have known quantities and unknown quantities, are established for each baseline. Unknowns for the baseline between base stations are estimated, and then used to correlate and reduce the number of unknowns associated with rover baselines, thereby improving accuracy of the rover's estimated position.